

**REMARKS**

**Status of the Claims**

Claims 1-28 are pending in this application. No claims have been canceled or added. Claim 10 has been amended to recite that the product of the process is a soluble complex. Support for this amendment is found for instance in Example 2 at page 11, line 24 of the specification, which states that the "achieved solution was taken into a 100 ml glass reactor for solvent evaporation". Applicants submit that no new matter has been added by the above claim amendment.

**Rejection under 35 USC 112, first paragraph**

The Examiner rejects claims 1-28 for allegedly reciting subject matter that is not described in the original disclosure. In the Office Action, the Examiner contends that the Examples do not support the description of the invention as a soluble complex. Applicants respectfully disagree with the Examiner. Applicants traverse the rejection and respectfully request the withdrawal thereof.

Applicants submit that the present invention is directed to a soluble magnesium halide electron donor complex and the process of making the same. Applicants submit that this invention is adequately described in the specification so as to convey to those of ordinary skill in the art that the Applicants had possession of the invention at the time of filing the present application. The

first line of the specification clearly conveys the invention as claimed, which reads, "The invention relates to a soluble complex comprising a magnesium dihalide and an electron donor." The whole of the invention relates to soluble complexes. The Examples illustrate soluble complexes.

For instance, please see Example 1. In Example 1, a magnesium dihalide alcohol (magnesium chloride and 1-undecanol) complex slurry is treated with toluene to obtain the property of being able to dissolve. Then, dialkyl magnesium (butyl octyl magnesium) and an electron donor precursor (phthaloyl chloride) are added and reacted with the magnesium dihalide alcohol complex to yield the claimed magnesium dihalide electron donor complex  $(\text{MgCl}_2)_{1.5} \cdot \text{DUP}$  (See page 11, line 24 of the specification.) It is clear from the original disclosure that the claimed complex is by definition soluble. One of ordinary skill in the art would clearly understand that the toluene treatment unambiguously aims at dissolving the complex slurry. As such, Applicants submit that claims 1 and 10 are supported by Example 1.

Moreover, Example 2 describes the preparation of a magnesium dialkoxide (magnesium di-2-ethyl-1-hexane oxide) and its reaction with an electron donor precursor (phthaloyl chloride). Example 2 yields the claimed magnesium dihalide electron donor complex  $\text{MgCl}_2 \cdot \text{DOP}$ . See page 8, last sentence to page 9, first sentence, which reads, "After this **the reaction solution** was allowed to cool

down to room temperature. 28.8g of **the achieved solution** was taken into a 100ml glass reactor for solvent evaporation." (emphasis added.)

Furthermore, in Examples 4-7, synthesis essentially according to the first embodiment of the invention is described in detail. The final step is described as follows: "After this [the addition of the dialkyl magnesium to the magnesium dihalide alcohol complex] 5.10 ml (7.19 g, 35.4 mmol) of phthaloyl dichloride (PDC) was added to produce a  $\text{MgCl}_2$  donor complex **solution**." (emphasis added.) Applicants submit that the examples clearly describe a soluble complex (claim 1) and the process of preparing a soluble complex (claim 10).

In the Office Action, the Examiner contends that the reaction mixture is not soluble, but is in solid form in light of Example 3 in the specification. The Examiner concluded this from the agitation of the reaction mixture in Example 3. Applicants respectfully disagree with the Examiner's conclusion. Applicants submit that the disclosure as a whole conveys to one of ordinary skill in the art that Applicants were in possession of a soluble complex as claimed in claim 1. The agitation in Example 3 is to dissolve the complex. One of ordinary skill in the art would comprehend that the complex is soluble from this disclosure. Moreover, the complex was obtained in solid form by evaporation. Evaporation is used for solutions and not solids. One of ordinary

skill in the art knows that evaporation is not used to remove liquid from a solid. Instead, to remove liquid from a solid, one would use decantation and/or filtration. Evaporation is used to solidify from a solution.

The Examiner also considered pages 5-8 and concluded that the complex is not soluble. Applicants respectfully disagree. Applicants submit that the present invention is not directed to the solubilization of the reactants. The invention is directed to a soluble complex, not reactants. Claim 1 is directed to a soluble complex comprising a magnesium dihalide and an electron donor. Claim 10 is directed to the process of preparing the same. Applicants do not claim soluble reactants.

For the foregoing reasons, Applicants respectfully request that this rejection be withdrawn and that the claims be allowed since the original disclosure as illustrated above clearly describes the presently claimed invention in full, clear, concise and exact terms so as to convey that Applicants were in possession of the invention at the time the application was filed.

**Comments on Miya et al. USP 5,100,849 (Miya '849)**

Miya '849 discloses a solution of Mg compound ( $\text{MgCl}_2$ ) and alcohol (ethanol) formed, which is sprayed and cooled in a spray column to form solid particles of  $\text{MgCl}_2 \cdot 6\text{EtOH}$ . (See example 1 and the claims.) By drying, the amount of alcohol is reduced to a

desired level (e.g.  $\text{MgCl}_2 \cdot 1.7\text{EtOH}$ , see example 1.) The solid  $\text{MgCl}_2 \cdot 1.7\text{EtOH}$  carrier is treated with  $\text{TiCl}_4$  and electron donating agent in order to achieve a catalyst. Miya '849 fails to disclose the formation of a soluble complex of magnesium dihalide and electron donor of formula I, II or III as recited in the present claims. Instead, Miya '849 discloses a solid  $\text{MgCl}_2 \cdot 1.7\text{EtOH}$  carrier which is further treated with  $\text{TiCl}_4$  and a donor.

On the other hand, Applicants submit that the present invention is directed to a soluble magnesium halide - electron donor complex, the molecular elements of which consist of 0.5 to 2.0 electron donor molecules per one magnesium halide molecule. The objective of the inventors was to produce an amorphous (non crystalline)  $\text{MgCl}_2$  complex in situ without wasting titanium halide or producing harmful waste products or side reactions. This kind of complex is new. This complex has an x-ray diffraction pattern showing a dominant peak at  $4.5^\circ 2\theta$ , which shows that the donor has been complexed with  $\text{MgCl}_2$  at a molecular level, thereby breaking up the strong molecular structure of crystalline  $\text{MgCl}_2$ . This kind of complex produced by the process disclosed in the invention is novel. The stoichiometric amounts of the reagents used to produce the claimed soluble complex are essential to the invention. For comparison, if  $\text{MgCl}_2$  is reacted directly with a less polar solvent, no such peak will be seen, meaning no molecular level complex with  $\text{MgCl}_2$  is formed.

Furthermore, it can be seen that in the x-ray diffraction pattern there are no peaks at all at  $50^\circ$ ,  $30^\circ$  and  $35^\circ$   $2\theta$ , which peaks would show the existence of pure  $\text{MgCl}_2$ . (See page 4 of the specification.) However, in the x-ray diffraction of catalysts which are of the same type as those in Miya '849, no peak at  $4.5^\circ$   $2\theta$  can be seen, but instead at  $50^\circ$ ,  $30^\circ$  and  $35^\circ$   $2\theta$ . This can be seen in EP 586389 B1, page 5, figure 12. In EP 586389, the catalyst synthesis is basically the same as in Miya '849.

Applicants submit that for the foregoing reasons it is clear that the present invention is distinguished from the disclosure in Miya '849. As such, any rejection over Miya '849 should be withdrawn.

### **Conclusion**

As Applicants have addressed and overcome all rejections in the Office Action, Applicants respectfully request that the rejections be withdrawn and that the claims be allowed.


Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Kecia Reynolds (Reg. No. 47,021) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.


Applicants respectfully petition under the provisions of 37 C.F.R. § 1.136(a) and § 1.17 for a one-month extension of time in which to respond to the Examiner's Office Action. The Extension of time fee in the amount of \$110.00 is attached hereto.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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